UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,277	12/16/2003	Masayoshi Omura	17317	6160

23389 7590 04/26/2007
SCULLY SCOTT MURPHY & PRESSER, PC
400 GARDEN CITY PLAZA
SUITE 300
GARDEN CITY, NY 11530

EXAMINER	
ROSENAU, DEREK JOHN	
ART UNIT	**PAPER NUMBER**
2834	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

TH

Office Action Summary	Application No.	Applicant(s)	
	10/737,277	OMURA ET AL.	
	Examiner	Art Unit	
	Derek J. Rosenau	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 3/7/2007. These drawings are accepted.

Claim Objections

2. Claim 2 is objected to because of the following informalities: "between 80 to 100 degrees" is grammatically incorrect. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kami et al. (US 5176140) in view of Kinoshita et al. (US 5722644).

5. With respect to claim 1, Kami et al. discloses an ultrasonic probe (Fig 35) comprising an ultrasonic transducer, the ultrasonic transducer further comprising, by sequential lamination: an acoustic lens (item 71); an acoustic matching layer (item 62); a piezoelectric element (item 61); and a backing member (item 63); wherein the backing member is arranged on a surface that is opposed to a surface side of the acoustic matching layer (Fig 35) in order to attenuate ultrasonic waves (column 14, lines 10-13) and the acoustic lens arranged at the piezoelectric element(Fig 35).

Kami et al. does not disclose expressly that the backing (damping layer) contains a synthetic rubber having a mixture including acrylonitrile-butadiene rubber, ethylene-propylene terpolymer, and at least inorganic fine powders.

Kinoshita et al. teaches that is well known to form a vibration-damping material of a mixture that includes acrylonitrile-butadiene rubber, ethylene-propylene terpolymer, and at least inorganic fine powders (column 1, line 65 through column 2, line 17).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the vibration-damping material of Kinoshita et al. with the ultrasonic transducer of Kami et al. for the benefit of the self-adhesive properties of the material (column 1, lines 65-67).

6. With respect to claim 2, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1. While neither Kami et al. nor Kinoshita et al. discloses expressly that the backing member has a hardness property of 80 to 100 degrees in the A scale in conformity with JISK6253 and the ultrasonic absorbing coefficient of 10 dB/mm or more at a frequency of 5 MHz, it has long been held that it is obvious to discover optimum or workable ranges by routine experimentation (*In re Aller*, 105 USPQ 233). As Kinoshita et al. discloses the constituent materials of the claimed synthetic rubber, it would have been obvious to use a material with a hardness of 80 to 100 degrees in the A scale in conformity with JISK6253 and an absorbing coefficient of 10 dB/mm or more at a frequency of 5 MHz, as these material properties could be achieved through routine experimentation.

7. With respect to claim 3, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1. Kami et al. discloses an exterior cap which immerses the ultrasonic transducer in an acoustic medium (column 27, lines 47-55). While neither Kami et al. nor Kinoshita et al. discloses expressly that the backing member immersed in the acoustic medium displays a percentage of absorption that is 2.5% or less and displays an acoustic impedance within a range of 1×10^6 to 8×10^6 kg/(m^2s), it has long been held that it is obvious to discover optimum or workable ranges by routine experimentation (*In re Aller*, 105 USPQ 233). As Kinoshita et al. discloses the constituent materials of the claimed synthetic rubber, it would have been obvious to use a material having a percentage of absorption of 2.5% or less and an acoustic impedance between 1×10^6 and 8×10^6 kg/(m^2s), as these material properties could be achieved through routine experimentation.

8. With respect to claim 4, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1. Kami et al. discloses a flexible shaft which rotates the ultrasonic transducer using a driving motor (column 27, lines 47-63).

9. With respect to claim 5, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1. Kami et al. discloses a coating film (Fig 1, item 103), which covers the ultrasonic transducer to protect it from the acoustic medium.

10. With respect to claim 7 and 8, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1. Kami et al. discloses a piezoelectric element which receives and transmits ultrasonic waves (column 6, lines 5-13); and a

backing member which is arranged at a rear surface of the piezoelectric element (Fig 35). Kinoshita et al. discloses that the backing member is a mixture including acrylonitrile-butadiene rubber, ethylene-propylene terpolymer, and at least inorganic fine powders (column 1, line 65 through column 2, line 17). While neither Kami et al. nor Kinoshita et al. discloses expressly that the synthetic rubber backing member has a hardness of approximately 80 to 100 degrees in the A scale in conformity with JISK6253, an ultrasonic absorbing coefficient of approximately 10 dB/mm or more at a frequency of 5 MHz, a percentage of absorption property of approximately 2.5% or less, or an acoustic impedance in an approximate range of 1×10^6 to 8×10^6 kg/(m^2s), it has long been held that it is obvious to discover optimum or workable ranges by routine experimentation (*In re Aller*, 105 USPQ 233). As Kinoshita et al. discloses the constituent materials of the claimed synthetic rubber, it would have been obvious to use a material with a hardness of approximately 80 to 100 degrees in the A scale in conformity with JISK6253, an absorbing coefficient of approximately 10 dB/mm or more at 5 MHz, a percentage of absorption property of approximately 2.5% or less, and an acoustic impedance in an approximate range of 1×10^6 to 8×10^6 kg/(m^2s), as these material properties could be achieved through routine experimentation.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kami et al. in view of Kinoshita et al. in further view of Erikson (US 4281550) and Dam et al. (US 6781287).

12. With respect to claim 6, the combination of Kami et al. and Kinoshita et al. discloses an ultrasonic probe according to claim 1.

Neither Kami et al. nor Kinoshita et al. discloses expressly that the acoustic medium is water with low attenuation of ultrasonic waves, an aqueous solution obtained by adding an additive to water, or oil with the low attenuation of ultrasonic waves.

Erikson teaches an ultrasonic probe in which an exterior cap (item 204) immerses the transducer in an acoustic medium of oil (column 3, lines 54-57).

Dam et al. teaches an ultrasonic probe in which an exterior cap (item 32) immerses the transducer in an acoustic medium of oil (item 33), and also teaches that oil displays a low attenuation to ultrasonic waves (column 3, lines 27-31).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the acoustic medium of Erikson and Dam et al. with the ultrasonic transducer of Kami et al. as modified by Kinoshita et al. for the benefit of using an acoustic medium using a material that is matched to the ultrasound transmissive properties of the human body (column 3, lines 54-57 of Erikson).

Response to Arguments

13. Applicant's arguments filed 3/7/2007 have been fully considered but they are not persuasive.

14. In response to applicant's argument that Kami et al. and Kinoshita et al. are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Kinoshita et al. is reasonably pertinent to the particular

problem with which the applicant was concerned; in this case, a vibration damping material was needed as a backing member. Kinoshita teaches the use of a vibration damping material including acrylonitrile-butadiene rubber, ethylene-propylene terpolymer, and at least inorganic fine powders. Therefore, as these materials are known for their vibration damping properties, it would have been obvious to incorporate them into the device of Kami et al.

15. Applicant's arguments with respect to claim 6 have been considered but are moot in view of the new ground(s) of rejection.

16. Applicant's arguments, see amendment, filed 3/7/2007, with respect to the drawings have been fully considered and are persuasive. The objections to the drawings have been withdrawn.

17. Applicant's arguments, see amendment, filed 3/7/2007, with respect to the specification have been fully considered and are persuasive. The objections to the specification have been withdrawn.

18. Applicant's arguments, see amendment, filed 3/7/2007, with respect to the claims have been fully considered and are persuasive. The objections to the claims have been withdrawn.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Toda (US 6307302) discloses an ultrasonic probe having an ultrasonic medium including an aqueous solution.

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is 571-272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau
Examiner
Art Unit 2834

DJR
4/16/2007